

AMENDMENT UNDER 37 CFR § 1.111
Serial No. 09/800,523

AMENDMENTS TO THE DRAWINGS

Proposed drawing amendments are submitted with respect to Figure 3b of the drawings. We look forward to the Examiner's advice that the drawing amendments are acceptable. At that time we will submit replacement formal drawings incorporating these amendments.

Attachment: APPENDIX A
Replacement Drawing FIG. 3b

AMENDMENT UNDER 37 CFR § 1.111
Serial No. 09/800,523

REMARKS

A total of 45 claims remain in the present application. The foregoing amendments are presented in response to the Office Action mailed March 21, 2005, wherefore reconsideration of this application is requested.

By way of the above-noted amendments, claims 19 and 45 have been amended to more clearly define features of the present invention. FIG. 3b has been amended to correct an inadvertently duplicated reference numeral, and thereby conform the drawing to the corresponding description in the specification.

In preparing the above-noted amendments, careful attention was paid to ensure that no new subject matter has been introduced.

Referring now to the text of the Office Action:

- claims 10, 19-26, 36 and 45 stand objected to under 35 U.S.C. § 112 as failing to distinctly claim the subject matter of the present invention;
- claims 1, 2, 4, 5, 8, 9, 27, 28, 30, 31, 34, 35 and 45 stand rejected under 35 U.S.C. § 102(e), as being unpatentable over the teaching of United States Patent No. 6,331,989 (Tezuka);
- claims 3, 6, 29 and 32 stand rejected under 35 U.S.C. § 103(a), as being unpatentable over the teaching of United States Patent No. 6,331,989 (Tezuka) in view of United States Patent No. 6,069,928 (Gupta); and
- claims 7, 11-18, 33 and 37-44 are objected to as being dependent on a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As an initial matter, applicant appreciates the Examiner's indication of allowable subject matter in claims 7, 11-18, 33 and 37-44. The Examiner's various claim rejections are believed to be traversed by the above-noted claim amendments, and further in view of the following discussion.

AMENDMENT UNDER 37 CFR § 1.111
Serial No. 09/800,523

Rejections under 35 U.S.C. § 112

With reference to claims 19-26, Applicant notes that the term "hamming distance" is well known in the art. Thus, for example, the National Institute for Standards and Technology defines "Hamming Distance" as:

"The number of bits which differ between two binary strings. More formally, the distance between two strings A and B is $\sum |A_i - B_i|$.

The Hamming distance can be interpreted as the number of bits which need to be changed (corrupted) to turn one string into the other. Sometimes the number of characters is used instead of the number of bits".

See, <http://www.nist.gov/dads/HTML/hammingdist.html>

Applying this definition to the present invention, the person of ordinary skill in the art will immediately recognise that the claimed limitation to "the position word having significant hamming distance relative to a shifted version of itself" means that $\sum |A_i - B_i|$ (where A is the position word and B is a phase-shifted version of the position word) is "significant". Similarly, the person of ordinary skill in the art will immediately recognise that the claimed limitation to "the identifier word having significant hamming distance relative to each of the other identifier words in the set" means that each $\sum |A_i - B_i|$ (where A is the identifier word and B is another identifier word within the set of identifier words) is "significant". The meaning of a "significant" hamming distance is clearly defined at paragraph 40 of the specification, thus:

...a "significant" hamming distance refers to a hamming distance that is at least $\frac{1}{2}$ of the maximum theoretically possible hamming distance, based on the length of the respective word.

Claim 19 has been amended to incorporate this definition of "significant hamming distance" into the claim.

With reference to claims 10 and 36, the Examiner's objection is not understood. Claim 10 depends from claims 1, 4, 8, 9. Claim 1 defines a step of "detecting a respective unique synchronizing word in each of the recovered sub-streams". Claim 4 adds a further limitation that this step includes "searching each recovered sub-stream to detect a respective synchronizing word". Claim 8 adds a further limitation of "asserting information indicative

AMENDMENT UNDER 37 CFR § 1.111
Serial No. 09/800,523

of the synchronizing word detected in the respective recovered sub-stream". Thus, claim 8 defines an embodiment in which "information indicative of the synchronizing word detected in the respective recovered sub-stream" is asserted, for each recovered sub-stream. This embodiment is clearly illustrated at FIGs. 1 and 2 and described in detail starting at paragraph 47. Thus, each individual framer 28 detects a synchronizing word in its respective recovered substream 20, and asserts information (i.e. the found position word 42 and found symbol 44) indicative of the synchronizing word.

Claims 9 and 10 are directed to operation of a registry process of the master framer 30, as illustrated in FIG. 3b and described in detail at paragraph 57. Thus, Claim 9 defines the steps of "identifying a respective one of the interleaved sub-streams using the asserted information indicative of the synchronizing word detected in the recovered sub-stream" and "associating the identified interleaved sub-stream with the recovered sub-stream", which the person of ordinary skill in the art will immediately recognise corresponds with steps 130 and 136 in FIG. 3b. Claim 10 defines that "the search of the recovered sub-stream [is re-initialized] if the identified interleaved sub-stream has previously been associated with another one of the recovered sub-streams". The person of ordinary skill in the art will immediately recognise that this limitation corresponds with steps 133 and 134 in FIG. 3b, and described at paragraph 57 thus:

"If the identified sub-stream 20 has already been associated with another one of the individual framers (at 132), as indicated by an appropriate entry in the registry 48, then the master framer 30 asserts a Flush signal 54 (at 134) to reset the individual framer 28 back to State-0 100, and thus re-start the process of acquiring and identifying the respective recovered sub-stream 20."

Note that in this passage, the master framer 30 associates the identified sub-stream with an individual framer 28. However, the person of ordinary skill in the art will recognise that, since each individual framer 28 receives and processes a respective one recovered sub-stream 20, there is no practical difference between associating an identified sub-stream with a respective individual framer and associating the identified sub-stream with a respective recovered sub-stream. Thus, it is believed that the person of ordinary skill in the art will suffer no confusion or uncertainty regarding the subject matter of claim 10. A corresponding analysis yield an identical result with respect to claim 36. Thus it is believed that claims 10 and 36 satisfy the requirements of 35 U.S.C. § 112.

AMENDMENT UNDER 37 CFR § 1.111
Serial No. 09/800,523

With reference to claim 45, Applicant has amended the claim language to more clearly define the features of the claimed invention.

In light of the foregoing, it is believed that the claims are fully compliant with the requirements of 35 U.S.C. § 112.

Rejections under 35 U.S.C. §102(e)

In support of his rejection of claims 1, 2, 4, 5, 8, 9, 27, 28, 30, 31, 34, 35 and 45 under 35 U.S.C. §102(e), the Examiner asserts that Tezuka teaches a step of detecting a respective unique synchronizing word in each of the recovered sub-streams within a predetermined search window. Applicant respectfully disagrees.

United States Patent No. 6,331,989 (Tezuka) teaches a method and system for setting the output position of signals demultiplexed from a received signal. Thus:

"... The receiver is constituted by a demultiplexing circuit 2 for bit-demultiplexing the above multiplexed signal received from the transmitter through an optical fiber 9 and a frame synchronization circuit 3. ... The signal output positions of the demultiplexing circuit 2, i.e., the data phases, are changed (rotated) in accordance with a bit rotate signal (designation signal) X output from the frame synchronization circuit 3. " (col. 3, lines 28-37)

"The receiver ... includes the frame synchronization circuit 3 for detecting a sync pattern from the signal output from a predetermined output position of the demultiplexing circuit 2. When no sync pattern is detected, the bit rotate signal is output from the frame synchronization circuit 3. In accordance with this bit rotate signal, the demultiplexing circuit 2 sequentially changes the output positions and the data phases of the original signals. With this operation, predetermined signals can be output to predetermined output positions with a simple circuit arrangement. (Col. 4, lines 57-67, Underlining added)

Thus, it will be seen that the embodiment of FIG. 1, includes only one frame synchronization circuit 3 for detecting a predetermined sync pattern. This frame synchronization circuit 3 does not attempt to detect "a respective unique synchronizing

AMENDMENT UNDER 37 CFR § 1.111
Serial No. 09/800,523

word in each of the recovered sub-streams" as required by the present invention, but rather examines a "current" signal to determine whether or not it contains a predetermined sync pattern. When no sync pattern is found, a "bit rotate" signal is generated to cause the demultiplexer to shift the positions of the demultiplexed signals. This causes the frame synchronization circuit 3 to receive and examine a different demultiplexed signal, and this process continues until the predetermined sync pattern is detected.

The embodiment of FIG. 2 provides a respective frame synchronization circuit 3 for each demultiplexed signal, and then uses detection of the sync pattern to control a switch 17 which sets the positions of the demultiplexed signals. Thus:

"When, for example, a signal obtained by multiplexing the four signals A to D is received from the transmission system, the multiplexed signal is demultiplexed by the demultiplexing circuit 12, as in the above embodiment. In the initial state, the signals C, D, A, and B are output to the outputs E to H in the order named in accordance with the signal phases.

In this case, since the signal A, which has an STM-1 sync byte as a sync pattern, is output as the output G of the demultiplexing circuit 12, the sync pattern is detected by the corresponding frame synchronization circuit 15. As a result, a control signal R is set at "H" level. Meanwhile, since no sync pattern is detected by the frame synchronization circuits 13, 14, and 16, corresponding control signals P, Q, and S are set at "L" level. The switch 17 determines the relationship between the outputs E to H and the outputs I to L on the basis of the "H"-level control signal R." (col. 5, lines 36-52, underlining added)

Accordingly, although the embodiment of FIG. 2, provides a respective frame synchronization circuit 13-16 for each demultiplexed signal E-H, all of these circuits operate to detect the same predetermined sync pattern. Proper operation of the switch 17 depends on the sync pattern being found in only one of the demultiplexed signals.

In light of the foregoing, the person of ordinary skill in the art will recognise that Tezuka does not teach or suggest a method or system in which "a respective unique synchronizing word [is detected] in each of the recovered sub-streams..." as required by the present invention. In fact, Tezuka teaches directly away from the solution of the present

AMENDMENT UNDER 37 CFR § 1.111
Serial No. 09/800,523

invention, by teaching two embodiments that rely on the detection of a single predetermined sync pattern. Thus it is respectfully submitted that Tezuka fails to teach or fairly suggest all of the features of the present invention, and therefore cannot support a rejection under 35 U.S.C. §102(e).

Rejections under 35 U.S.C. §103(a)

As noted above, Tezuka fails to teach or fairly suggest all of the features of the present invention. United States Patent No. 6,069,928 (Gupta) fails to provide the missing teaching. In particular, Gupta does not teach or fairly suggest detecting "a respective unique synchronizing word in each of [a plurality of] recovered sub-streams..." as required by the present invention.

In light of the foregoing, it is respectfully submitted that the presently claimed invention is clearly distinguishable over the teaching of the cited references, taken alone or in any combination. Thus, it is believed that the present application is in condition for allowance, and early action in that respect is courteously solicited.

If any extension of time under 37 C.F.R. § 1.136 is required to obtain entry of this response, such extension is hereby respectfully requested. If there are any fees due under 37 C.F.R. §§ 1.16 or 1.17 which are not enclosed herewith, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our Deposit Account No. 19-5113.

Respectfully submitted,



By: Kent Daniels, P.Eng.
Reg. No. 44206
Attorney for the Applicants

Date: June 14, 2005

Ogilvy Renault LLP
Suite 1600
1981 McGill College Avenue
Montreal, Quebec
Canada, H3A 2Y3
(613) 780-8673